Attorney Docket No. 50277-1646

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application: Claim underlining shows the changes from the originally issued patent.

1 1-26. (Cancelled)

1	27.	(Five Times Amended) A method of parallelizing an operation, the method comprising
2		the steps of:
3		dividing the operation into a set of work partitions;
4		assigning work partitions from said set of work partitions to a plurality of entities,
5		wherein at least one entity of said plurality of entities is assigned a plurality of
6		work partitions from said set of work partitions;
7		wherein the step of assigning work partitions is performed by assigning the work
8		partitions in a sequence based at least in part on sizes associated with the work
9		partitions;
10		said plurality of entities operating in parallel on work partitions assigned to said plurality
11		of entities to perform said operation; and
12		wherein assigning the work partitions in a sequence includes assigning a first previously
13		unassigned work partition to a particular entity of the plurality of entities, and
14		when the particular entity completes processing the first work partition, picking a
15		second previously unassigned work partition based at least in part to the size of
16		the second work partition, and assigning the second unassigned work partition to
17		the particular entity for processing,
18		wherein the method is performed by one or more computing devices.
1	20	(Thrice Amended) The method of Claim 27 wherein the step of assigning the work

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assigning relatively smaller work partitions.

partitions in a sequence is performed by assigning relatively larger work partitions before

1	29.	(Five Times Amended) A method of parallelizing an operation, the method comprising
2		the steps of:
3		dividing the operation into a set of work partitions;
4		assigning work partitions from said set of work partitions to a plurality of entities,
5		wherein at least one entity of said plurality of entities is assigned a plurality of
6		work partitions from said set of work partitions, wherein the step of assigning
7		work partitions includes:
8		assigning said at least one entity a first work partition from said set of work
9		partitions; and
10		after said at least one entity has completed operation on said first work partition,
11		assigning said at least one entity a second work partition from said set of work
12		partitions, wherein the step of assigning said at least one entity a second work
13		partition includes
14		determining whether there are any unassigned work partitions from a first level in
15		a hierarchy to which said first work partition belonged; and
16		if there are no unassigned work partitions from the first level in the
17		hierarchy, then selecting said second work partition from a level in
18		said hierarchy that is two levels above said first level in said
19		hierarchy;
20		$\underline{said\ plurality\ of\ entities\ operating\ in\ parallel\ on\ work\ partitions\ assigned\ to\ said\ plurality}$
21		of entities to perform said operation; and
22		wherein the operation is specified in a query that corresponds to the hierarchy of
23		operations,
24		wherein the method is performed by one or more computing devices.
1	30.	$(Thrice\ Amended)\ \underline{A\ method\ of\ parallelizing\ an\ operation,\ the\ method\ comprising\ the}$
2		steps of:
3		dividing the operation into a set of work partitions;

4		assigning work partitions from said set of work partitions to a plurality of entities,
5		wherein at least one entity of said plurality of entities is assigned a plurality of
6		work partitions from said set of work partitions;
7		said plurality of entities operating in parallel on work partitions assigned to said plurality
8		of entities to perform said operation;
9		the method includes the step of generating a serial execution plan for operations in a
10		database management system (DBMS) running on a computer system;
11		the method includes the step of generating a parallelized execution plan for said serial
12		execution plan, said parallelized execution plan including first and second
13		operations;
14		the step of dividing an operation is performed by dividing said second operation;
15		the plurality of entities includes one or more slave processes operating on a plurality of
16		data partitions, the quantity of said data partitions being greater than the quantity
17		of said slave processes;
18		executing said parallelized execution plan when a plurality of parallel resources of said
19		computer system are available; and
20		executing said serial execution plan when said plurality of resources are not available,
21		wherein the method is performed by one or more computing devices.
1	31.	$(Twice\ Amended)\ \underline{The\ method\ of\ claim\ 30\ wherein\ said\ step\ of\ generating\ a\ parallelized}$
2		execution plan includes the steps of:
3		identifying one or more segments of said serial execution plan that can be parallelized;
4		<u>and</u>
5		identifying partitioning requirements of said one or more segments.
1	32.	$(Twice\ Amended)\ \underline{The\ method\ of\ claim\ 30\ wherein\ said\ step\ of\ generating\ a\ parallelized}$
2		execution plan is based on a specification of parallelism in a statement specifying one of
3		said operations.

2		steps of:
3		dividing the operation into a set of work partitions;
4		assigning work partitions from said set of work partitions to a plurality of entities,
5		wherein at least one entity of said plurality of entities is assigned a plurality of
6		work partitions from said set of work partitions;
7		said plurality of entities operating in parallel on work partitions assigned to said plurality
8		of entities to perform said operation;
9		generating an execution plan for said operation;
0		examining said execution plan from bottom up;
1		identifying a parallelized portion of said execution plan, said parallelized portion can be
2		processed in parallel, said parallelized portion including first and second
3		operations, said first and second operations being executable in parallel;
4		wherein the step of dividing the operation is performed by dividing said second operation;
5		wherein the plurality of entities includes one or more slave processes operating on a
6		plurality of data partitions, the quantity of said data partitions being greater than
7		the quantity of said slave processes;
8		identifying some serial portion of said execution plan, said serial portion can be processed
9		in serial; and
0		allocating a central scheduler between said parallelized portion and said serial portion,
1		wherein the method is performed by one or more computing devices.
1	34.	(Twice Amended) The method of Claim 33 further including the steps of:
2		identifying a first data flow requirement for a first portion of said execution plan said first
3		data flow requirement corresponding to a partitioning of a data flow required by
4		said first portion;
5		identifying a second data flow requirement for a second portion of said execution plan
6		said second data flow requirement corresponding by said second partian; and

(Thrice Amended) A method of parallelizing an operation, the method comprising the

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allocating a data flow director between said first portion and said second portion when

said first data flow requirement is not compatible with said second data flow

9		requirement said data flow director repartitioning a data flow of said first portion
10		to be compatible with said second data flow requirement.
1	35.	$(Thrice\ Amended)\ \underline{A\ method\ for\ parallelizing\ an\ operation,\ the\ method\ comprising\ the}$
2		steps of:
3		dividing the operation into a set of work partitions;
4		assigning work partitions from said set of work partitions to a plurality of entities,
5		wherein at least one entity of said plurality of entities is assigned a plurality of
6		work partitions from said set of work partitions;
7		said plurality of entities operating in parallel on work partitions assigned to said plurality
8		of entities to perform said operation;
9		generating an execution plan to execute database management system (DBMS) operations
10		in parallel, said execution plan including first and second operations;
11		wherein the step of dividing said operation is performed by dividing said second
12		operation;
13		initiating an operation coordinator in a computer system to coordinate execution of said
14		execution plan;
15		initiating, by said operation coordinator, a first set of slaves operating on a plurality of
16		data partitions to produce data, the quantity of said data partitions being greater
17		than the quantity of said first set of slave processes;
18		initiating, as said plurality of entities, by said operation coordinator, a second set of slaves
19		to consume data; and
20		directing said second set of slaves to produce data and said first set of slaves to consume
21		data when said first set of slaves finishes producing data,
22		wherein the method is performed by one or more computing devices.
1	36.	(Twice Amended) The method of claim 35 wherein said execution plan is comprised of
2		operator nodes and said operator nodes are linked together to form execution sets.

1	37.	(Thrice Amended) A method for parallelizing an operation, the method comprising the
2		steps of:
3		dividing the operation into a set of work partitions;
4		assigning work partitions from said set of work partitions to a plurality of entities,
5		wherein at least one entity of said plurality of entities is assigned a plurality of
6		work partitions from said set of work partitions;
7		said plurality of entities operating in parallel on work partitions assigned to said plurality
8		of entities to perform said operation:
9		generating an execution plan to execute said operations in parallel, said execution plan
10		including first and second operations;
11		wherein the step of dividing said operation includes dividing said first operation;
12		initiating producer slaves operating on a plurality of data partitions to produce a first data
13		production:
14		initiating consumer slaves to consume said first data production;
15		when said first data production is completed, generating an identification of a plurality of
16		said consumer slaves that did not receive data in said first data production;
17		examining said identification during a subsequent data production; and
18		reducing said subsequent data production such that said subsequent data production does
19		not produce data for said plurality of said consumer slaves.
20		wherein the method is performed by one or more computing devices.
1	38.	(Thrice Amended) A method for processing a query, the method comprising the steps of:
2		receiving a statement that specifies at least an operation;
3		determining a user-specified degree of parallelism to use in performing the operation;
4		dividing the operation into a set of work partitions;
5		performing a determination of how many entities to use to perform said operation based,
6		at least in part, on the user-specified degree of parallelism, wherein the amount of
7		entities that are chosen to use to perform on the operation is different than the
8		amount of entities that would have been chosen if no user-specified degree of
9		parallelism had been specified;

10		assigning work partitions from said set of work partitions to a plurality of entities based
11		on said determination; and
12		said plurality of entities operating in parallel on work partitions assigned to said plurality
13		of entities to perform said operation,
14		wherein the method is performed by one or more computing devices.
1	39.	(Twice Amended) The method of Claim 38 wherein:
2		the query requires a plurality of operations;
3		the user-specified degree of parallelism is specified in said statement, and
4		the statement specifies said degree of parallelism for a subset of the plurality of
5		operations required by the query.
1	40.	(Twice Amended) The method of Claim 39 wherein
2		the user-specified degree of parallelism is specified in said statement; and
3		the degree of parallelism specified by the query indicates that no amount of parallelism is
4		to be used during execution of a particular portion of the query.
1	41.	(Twice Amended) The method of Claim 38 wherein
2		the user-specified degree of parallelism is specified in said statement, and
3		the degree of parallelism specified by the query indicates a maximum amount of
4		parallelism to use during execution of said operation.
1	42.	(Thrice Amended) A method of processing a query, the method comprising the steps of:
2		dividing an operation required by said query into a set of work partitions by generating a
3		set of query fragments;
4		incorporating hints into at least some of said query fragments, wherein the hint associated
5		with a given query fragment indicates how to perform the work partition
6		associated with said given query fragment;
7		assigning query fragments from said set of query fragments to a plurality of entities; and

9		of entities to perform said operation, wherein entities working on a query
10		fragment associated with a hint perform the work partition associated with said
11		query fragment in a manner dictated by said hint,
12		wherein the method is performed by one or more computing devices.
1	43.	(Twice Amended) The method of Claim 42 wherein the step of incorporating hints
2		includes incorporating hints that dictate the operation of a table scan.
1	44.	(Twice Amended) The method of Claim 43 wherein the step of incorporating hints that
2		dictate the operation of a table scan includes incorporating hints that rowid partitioning is
3		to be used during the table scan.
1	45.	(Twice Amended) The method of Claim 42 wherein the step of incorporating hints
2		includes incorporating hints that specify performance of a full table scan.
	46.	(This Associated The maked of Cities 42) having the star of incompating him
1	40.	(Twice Amended) The method of Claim 42 wherein the step of incorporating hints
2		includes incorporating hints that specify using a particular type of join.
1	47.	(Twice Amended) The method of Claim 46 wherein the step of incorporating hints that
2		specify using a particular type of join includes incorporating hints that specify using a
3		sort/merge join.
,		sortines join
1	48.	(Twice Amended) The method of Claim 46 wherein the step of incorporating hints that
2		specify using a particular type of join includes incorporating hints that specify using a
3		nested loop join.
1	49.	(Thrice Amended) A method of processing a query, the method comprising the steps of:
2		determining a hierarchy of operations associated with a query;
3		dividing a first operation required by said query into a first set of work partitions;

said plurality of entities operating in parallel on query fragments assigned to said plurality

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4		dividing a second operation required by said query into a second set of work partitions,
5		wherein said second operation immediately follows said first operation in said
6		hierarchy;
7		dividing a third operation required by said query into a third set of work partitions,
8		wherein said third operation immediately follows said second operation in said
9		hierarchy;
10		assigning work partitions from said first set of work partitions to a first plurality of
11		entities;
12		said first plurality of entities operating in parallel on work partitions assigned to said first
13		plurality of entities from said first set of work partitions to perform said first
14		operation;
15		$assigning\ work\ partitions\ from\ said\ second\ set\ of\ work\ partitions\ to\ a\ second\ plurality\ of$
16		entities, wherein said second plurality of entities are different entities than said
17		first plurality of entities; and
18		said second plurality of entities operating in parallel on work partitions assigned to said
19		second plurality of entities from said second set of work partitions to perform said
20		second operation;
21		assigning work partitions from said third set of work partitions to said first plurality of
22		entities; and
23		$\underline{said}\; first\; plurality\; of\; entities\; operating\; in\; parallel\; on\; work\; partitions\; assigned\; to\; \underline{said}\; first\;$
24		plurality of entities from said third set of work partitions to perform said third
25		operation,
26		wherein the method is performed by one or more computing devices.
1	50.	$(Twice\ Amended)\ \underline{The\ method\ of\ Claim\ 49\ further\ comprising\ performing\ the\ following}$
2		steps when a given entity in said first set of entities finishes performing a work partition
3		from said first set of work partitions:
4		determining whether there are any unassigned work partitions from said first set of work
5		partitions; and

6		if there are no unassigned work partitions from said first set of work partitions, then
7		assigning the given entity a work partition selected from said third set of work
8		partitions; and
9		if there are unassigned work partitions from said first set of work partitions, then
10		assigning the given entity a work partition selected from said first set of work
11		partitions.
1	51.	(Twice Amended) The method of Claim 49 wherein the hierarchy includes odd levels and
2		even levels, and the method further comprises the steps of assigning work partitions from
3		odd levels to said first plurality of entities and work partitions from even levels to said
4		second plurality of entities.
1	52.	(Twice Amended) The method of Claim 49 wherein performing work partitions in said
2		first set of work partitions causes said first set of entities produce output consumed by
3		$\underline{\text{said second plurality of entities, and performing work partitions in said third set of work}$
4		partitions causes said first set of entities to consume output produced by said second
5		plurality of entities.
1	53-62.	(Cancelled)
1	63.	(Four Times Amended) A computer-readable storage medium carrying instructions for
2		parallelizing an operation, the instructions including instructions for performing the steps
3		<u>of:</u>
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dividing the operation into a set of work partitions;
assigning work partitions from said set of work partitions to a plurality of entities,
wherein at least one entity of said plurality of entities is assigned a plurality of
work partitions from said set of work partitions;
wherein the step of assigning work partitions is performed by assigning the work
partitions in a sequence based at least in part on sizes associated with the work
partitions;

11		said plurality of entities operating in parallel on work partitions assigned to said plurality
12		of entities to perform said operation; and
13		wherein assigning the work partitions in a sequence includes assigning a first previously
14		unassigned work partition to a particular entity of the plurality of entities, and
15		when the particular entity completes processing the first work partition, picking a
16		second previously unassigned work partition based at least in part to the size of
17		the second work partition, and assigning the second unassigned work partition to
18		the particular entity for processing.
	64.	(This America) The control of the co
1	04.	(Thrice Amended) The computer-readable storage medium of Claim 63 wherein the step
2		of assigning the work partitions in a sequence is performed by assigning relatively larger
3		work partitions before assigning relatively smaller work partitions.
1	65.	(Four Times Amended) A computer-readable storage medium carrying instructions for
2	05.	parallelizing an operation, the instructions including instructions for performing the steps
		of:
3		_
4		dividing the operation into a set of work partitions;
5		assigning work partitions from said set of work partitions to a plurality of entities.
6		wherein at least one entity of said plurality of entities is assigned a plurality of
7		work partitions from said set of work partitions, wherein the step of assigning
8		work partitions includes
9		assigning said at least one entity a first work partition from said set of work partitions;
10		<u>and</u>
11		after said at least one entity has completed operating on said first work partition,
12		assigning said at least one entity a second work partition from said set of work
13		partitions;
14		said plurality of entities operating in parallel on work partitions assigned to said plurality
15		of entities to perform said operation;
16		wherein the operation is specified in a query that corresponds to a hierarchy of operations;
17		<u>and</u>

18		the step of assigning said at least one entity a second work partition includes
19		determining whether there are any unassigned work partitions from a first level in
20		the hierarchy to which said first work partition belonged; and
21		if there are no unassigned work partitions from the first level in the hierarchy, then
22		selecting said second work partition from a level in said hierarchy that is
23		two levels above said first level in said hierarchy.
1	66.	(Four Times Amended) A computer-readable storage medium carrying instructions for
2		parallelizing an operation, the instructions including instructions for performing the steps
3		<u>of:</u>
4		dividing the operation into a set of work partitions;
5		assigning work partitions from said set of work partitions to a plurality of entities,
6		wherein at least one entity of said plurality of entities is assigned a plurality of
7		work partitions from said set of work partitions;
8		said plurality of entities operation in parallel on work partitions assigned to said plurality
9		of entities to perform said operation;
10		wherein the instructions include instructions for performing the step of generating a serial $$
11		execution plan for operations in a database management system (DBMS) running
12		on a computer system;
13		wherein the instructions include instructions for performing the step of generating a
14		parallelized execution plan for said serial execution plan, said parallelized
15		execution plan including first and second operations;
16		wherein the step of dividing an operation is performed by dividing said second operation;
17		wherein the plurality of entities includes one or more slave processes operating on a
18		plurality of data partitions, the quantity of said data partitions being greater than
19		the quantity of said slave processes;
20		wherein the instructions include instructions for performing the step of executing said
21		parallelized execution plan when a plurality of parallel resources of said computer
22		system are available; and

	wherein the instructions include instructions for performing the step of executing said
	serial execution plan when said plurality of resources are not available.
67.	(Thrice Amended) The computer-readable storage medium of claim 66 wherein said step
	of generating a parallelized execution plan includes the steps of:
	identifying one or more segments of said serial execution plan that can be parallelized;
	<u>and</u>
	identifying partitioning requirements of said one or more segments.
68.	(Thrice Amended) The computer-readable storage medium of claim 66 wherein said step
	of generating a parallelized execution plan is based on a specification of parallelism in a
	statement specifying one of said operations.
69.	$(Four\ Times\ Amended)\ \underline{A\ computer-readable\ storage\ medium\ carrying\ instructions\ for}$
	parallelizing an operation, the instructions including instructions for performing the steps
	of:
	dividing the operation into a set of work partitions;
	assigning work partitions from said set of work partitions to a plurality of entities,
	wherein at least one entity of said plurality of entities is assigned a plurality of
	work partitions from said set of work partitions;
	said plurality of entities operating in parallel on work partitions assigned to said plurality
	of entities to perform some operation;
	generating an execution plan for said operation;
	examining said execution plan from bottom up;
	identifying a parallelized portion of said execution plan, said parallelized portion can be
	processed in parallel, said parallelized portion including first and second
	operations, said first and second operations being executable in parallel;
	wherein the step of dividing the operation is performed by dividing said second operation;
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16		wherein the plurality of entities includes one or more slave processes operating on a
17		plurality of data partitions, the quantity of said data partitions being greater than
18		the quantity of said slave processes;
19		identifying some serial portion of said execution plan, said serial portion can be processed
20		in serial; and
21		allocating a central scheduler between said parallelized portion and said serial portion.
1	70.	(Thrice Amended) The computer-readable storage medium of Claim 69 further including
2		instructions for performing the steps of:
3		identifying a first data flow requirement for a first portion of said execution plan said first
4		data flow requirement corresponding to a partitioning of a data flow required by
5		said first portion;
6		identifying a second data flow requirement for a second portion of said execution plan
7		said second data flow requirement corresponding by said second portion; and
8		allocating a data flow director between said first portion and said second portion when
9		said first data flow requirement is not compatible with said second data flow
10		requirement said data flow director repartitioning a data flow of said first portion
11		to be compatible with said second data flow requirement.
1	71.	$(Four\ Times\ Amended)\ \underline{A\ computer-readable\ storage\ medium\ carrying\ instructions\ for}$
2		parallelizing an operation, the instructions including instructions for performing the steps
3		of:
4		dividing the operation into a set of work partitions;
5		assigning work partitions from said set of work partitions to a plurality of entities,
6		wherein at least one entity of said plurality of entities is assigned a plurality of
7		work partitions from said set of work partitions;
8		said plurality of entities operating in parallel on work partitions assigned to said plurality
9		of entities to perform said operation;
10		generating an execution plan to execute database management system (DBMS) operations
11		in parallel, said execution plan including first and second operations;

12		wherein the step of dividing said operation is performed by dividing said second
13		operation;
14		initiating an operation coordinator in a computer system to coordinate execution of said
15		execution plan;
16		initiating, by said operation coordinator, a first set of slaves operating on a plurality of
17		data partitions to produce data, the quantity of said data partitions being greater
18		than the quantity of said first set of slave processes;
19		initiating, as said plurality of entities, by said operation coordinator, a second set of slaves
20		to consume data; and
21		directing said second set of slaves to produce data and said first set of slaves to consume
22		data when said first set of slaves finishes producing data.
1	72.	$(Thrice\ Amended)\ \underline{The\ computer-readable\ storage\ medium\ of\ claim\ 71\ wherein\ said}$
2		execution plan is comprised of operator nodes and said operator nodes are linked together
3		to form execution sets.
1	73.	$(Four\ Times\ Amended)\ \underline{A\ computer-readable\ storage\ medium\ carrying\ instructions\ for}$
2		parallelizing an operation, the instructions including instructions for performing the steps
3		of:
4		dividing the operation into a set of work partitions;
5		assigning work partitions from said set of work partitions to a plurality of entities,
6		wherein at least one entity of said plurality of entities is assigned a plurality of
7		work partitions from said set of work partitions;
8		said plurality of entities operating in parallel on work partitions assigned to said plurality
9		of entities to perform said operation;
10		generating an execution plan to execute said operations in parallel, said execution plan
11		including first and second operations;
12		wherein the step of dividing said operation includes dividing said first operation;
13		initiating producer slaves operating on a plurality of data partitions to produce a first data
14		production:

15		initiating consumer slaves to consume said first data production;
16		when said first data production is completed, generating an identification of a plurality of
17		said consumer slaves that did not receive data in said first data production;
18		examining said identification during a subsequent data production; and
19		reducing said subsequent data production such that said subsequent data production does
20		not produce data for said plurality of said consumer slaves.
1	74.	$(Four\ Times\ Amended)\ \underline{A\ computer-readable\ storage\ medium\ storing\ instructions\ for}$
2		processing a query, the instructions including instructions for performing the steps of:
3		receiving a statement that specifies at least an operation;
4		determining a user-specified degree of parallelism to use in performing the operation;
5		dividing the operation into a set of work partitions;
6		performing a determination of how many entities to use to perform said operation based,
7		at least in part, on the user-specified degree of parallelism, wherein the amount of
8		entities that are chosen to use to perform on the operation is different than the
9		amount of entities that would have been chosen if no user-specified degree of
10		parallelism had been specified;
11		assigning work partitions from said set of work partitions to a plurality of entities based
12		on said determination; and
13		said plurality of entities operating in parallel on work partitions assigned to said plurality
14		of entities to perform said operation.
1	75.	(Thrice Amended) The computer-readable storage medium of Claim 74 wherein:
2		the query requires a plurality of operations;
3		the user-specified degree of parallelism is specified in said statement, and
4		the statement specifies said degree of parallelism for a subset of the plurality of
5		operations required by the query.
1	76.	(Thrice Amended) The computer-readable storage medium of Claim 75 wherein
2		the user-specified degree of parallelism is specified in said statement; and

1	77.	(Thrice Amended) The computer-readable storage medium of Claim 74 wherein
2		the user-specified degree of parallelism is specified in said statement, and
3		the degree of parallelism specified by the query indicates a maximum amount of
4		parallelism to use during execution of said operation.
1	78.	(Four Times Amended) A computer-readable storage medium carrying instructions for
2		processing a query, the instructions including instructions for performing the steps of:
3		dividing an operation required by said query into a set of work partitions by generating a
4		set of query fragments;
5		incorporating hints into at least some of said query fragments, wherein the hint associated
6		with a given query fragment indicates how to perform the work partition
7		associated with said given query fragment;
8		assigning query fragments from said set of query fragments to a plurality of entities; and
9		said plurality of entities operating in parallel on query fragments assigned to said plurality
10		of entities to perform said operation, wherein entities working on a query
11		fragment associated with a hint perform the work partition associated with said
12		query fragment in a manner dictated by said hint.
1	79.	(Thrice Amended) The computer-readable storage medium of Claim 78 wherein the step
2		of incorporating hints includes incorporating hints that dictate the operation of a table
3		scan.
1	80.	(Thrice Amended) The computer-readable storage medium of Claim 79 wherein the step
2		of incorporating hints that dictate the operation of a table scan includes incorporating
3		hints that rowid partitioning is to be used during the table scan.

the degree of parallelism specified by the query indicates that no amount of parallelism is

to be used during execution of a particular portion of the query.

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1	81.	(Thrice Amended) The computer-readable storage medium of Claim 78 wherein the step
2		of incorporating hints includes incorporating hints that specify performance of a full table
3		scan.
1	82.	(Thrice Amended) <u>The computer-readable storage medium of Claim 78 wherein the step</u>
2		of incorporating hints includes incorporating hints that specify using a particular type of
3		<u>join.</u>
1	83.	(Thrice Amended) The computer-readable storage medium of Claim 82 wherein the step
2		of incorporating hints that specify using a particular type of join includes incorporating
3		hints that specify using a sort/merge join.
1	84.	(Thrice Amended) The computer-readable storage medium of Claim 82 wherein the step
2		of incorporating hints that specify using a particular type of join includes incorporating
3		hints that specify using a nested loop join.
1	85.	(Four Times Amended) A computer-readable storage medium carrying instructions for
2		processing a query, the instructions including instructions for performing the steps of:
3		determining a hierarchy of operations associated with a query;
4		dividing a first operation required by said query into a first set of work partitions;
5		dividing a second operation required by said query into a second set of work partitions,
6		wherein said second operation immediately follows said first operation in said
7		hierarchy;
8		dividing a third operation required by said query into a third set of work partitions.
9		wherein said third operation immediately follows said second operation in said
10		hierarchy;
11		assigning work partitions from said first set of work partitions to a first plurality of
12		entities:

13		$said\ first\ plurality\ of\ entities\ operating\ in\ parallel\ on\ work\ partitions\ assigned\ to\ said\ first$
14		plurality of entities from said first set of work partitions to perform said first
15		operation;
16		assigning work partitions from said second set of work partitions to a second plurality of
17		entities, wherein said second plurality of entities are different entities than said
18		first plurality of entities; and
19		said second plurality of entities operating in parallel on work partitions assigned to said
20		second plurality of entities from said second set of work partitions to perform said
21		second operation;
22		assigning work partitions from said third set of work partitions to said first plurality of
23		entities; and
24		said first plurality of entities operating in parallel on work partitions assigned to said first
25		plurality of entities from said third set of work partitions to perform said third
26		operation.
1	86.	(Thrice Amended) The computer-readable storage medium of Claim 85 further
1	86.	(Thrice Amended) The computer-readable storage medium of Claim 85 further comprising instructions for performing the following steps when a given entity in said
	86.	· · · · · · · · · · · · · · · · · · ·
2	86.	comprising instructions for performing the following steps when a given entity in said
2	86.	comprising instructions for performing the following steps when a given entity in said first set of entities finishes performing a work partition from said first set of work
2 3 4	86.	comprising instructions for performing the following steps when a given entity in said first set of entities finishes performing a work partition from said first set of work partitions:
2 3 4 5	86.	comprising instructions for performing the following steps when a given entity in said first set of entities finishes performing a work partition from said first set of work partitions: determining whether there are any unassigned work partitions from said first set of work
2 3 4 5 6	86.	comprising instructions for performing the following steps when a given entity in said first set of entities finishes performing a work partition from said first set of work partitions: determining whether there are any unassigned work partitions from said first set of work partitions; and
2 3 4 5 6 7	86.	comprising instructions for performing the following steps when a given entity in said first set of entities finishes performing a work partition from said first set of work partitions: determining whether there are any unassigned work partitions from said first set of work partitions; and if there are no unassigned work partitions from said first set of work partitions, then
2 3 4 5 6 7 8	86.	comprising instructions for performing the following steps when a given entity in said first set of entities finishes performing a work partition from said first set of work partitions: determining whether there are any unassigned work partitions from said first set of work partitions; and if there are no unassigned work partitions from said first set of work partitions, then assigning the given entity a work partition selected from said third set of work
2 3 4 5 6 7 8	86.	comprising instructions for performing the following steps when a given entity in said first set of entities finishes performing a work partition from said first set of work partitions: determining whether there are any unassigned work partitions from said first set of work partitions; and if there are no unassigned work partitions from said first set of work partitions, then assigning the given entity a work partition selected from said third set of work partitions; and
2 3 4 5 6 7 8 9	86.	comprising instructions for performing the following steps when a given entity in said first set of entities finishes performing a work partition from said first set of work partitions: determining whether there are any unassigned work partitions from said first set of work partitions; and if there are no unassigned work partitions from said first set of work partitions, then assigning the given entity a work partition selected from said third set of work partitions; and if there are unassigned work partitions from said first set of work partitions, then
2 3 4 5 6 7 8 9 10	86.	comprising instructions for performing the following steps when a given entity in said first set of entities finishes performing a work partition from said first set of work partitions: determining whether there are any unassigned work partitions from said first set of work partitions; and if there are no unassigned work partitions from said first set of work partitions; then assigning the given entity a work partition selected from said third set of work partitions; and if there are unassigned work partitions from said first set of work partitions, then assigning the given entity a work partition selected from said first set of work
2 3 4 5 6 7 8 9 10	86. 87.	comprising instructions for performing the following steps when a given entity in said first set of entities finishes performing a work partition from said first set of work partitions: determining whether there are any unassigned work partitions from said first set of work partitions; and if there are no unassigned work partitions from said first set of work partitions; then assigning the given entity a work partition selected from said third set of work partitions; and if there are unassigned work partitions from said first set of work partitions, then assigning the given entity a work partition selected from said first set of work

- instructions for performing the steps of assigning work partitions from odd levels to said
 first plurality of entities and work partitions from even levels to said second plurality of
- 5 entities.
- 1 88. (Thrice Amended) The computer-readable storage medium of Claim 85 wherein
- 2 performing work partitions in said first set of work partitions causes said first set of
- 3 entities produce output consumed by said second plurality of entities, and performing
- 4 <u>work partitions in said third set of work partitions causes said first set of entities to</u>
- 5 consume output produced by said second plurality of entities.
- 1 89-91. (Canceled).
- 1 92. (Twice Amended) The method of Claim 38, wherein the user-specified degree of
 2 parallelism is specified in said statement.
- 1 93. (Twice Amended) The method of Claim 38, wherein the user-specified degree of parallelism is specified for operations that involve a particular table.
- 1 94. (Thrice Amended) <u>The computer-readable storage medium of Claim 74, wherein the</u>
 2 user-specified degree of parallelism is specified in said statement.
- 1 95. (Thrice Amended) The computer-readable storage medium of Claim 74, wherein the
- 2 <u>user-specified degree of parallelism is specified for operations that involve a particular</u>
- 3 table.